

Mutagenic Evaluation of Compound FDA 73-85 (Potassium Alginate)

6/15/75

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*IP*

LBI PROJECT #2468

MUTAGENIC EVALUATION OF

COMPOUND FDA 73-85

PM9005361

POTASSIUM ALGINATE

SUBMITTED TO

FOOD AND DRUG ADMINISTRATION  
DEPARTMENT OF HEALTH, EDUCATION AND WELFARE  
ROCKVILLE, MARYLAND

SUBMITTED BY

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JUNE 15, 1975



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## TABLE OF CONTENTS

	Page No.
EVALUATION SUMMARY.....	1
I. <u>OBJECTIVE</u> .....	2
II. <u>MATERIALS</u> .....	2
A.    Test Compound.....	2
B.    Indicator Microorganisms.....	2
C.    Reaction Mixture.....	2
D.    Tissue Homogenates and Supernatants.....	3
E.    Positive Control Compounds.....	3
III. <u>METHODS</u> .....	3
A.    Toxicity.....	3
B.    Plate Tests.....	4
C.    Suspension Tests.....	4
D.    Preparation of Tissue Homogenates and 9,000 x g Cell Fractions.....	5
E.    Data Recording and Reporting.....	5
IV. <u>RESULTS SECTION</u> .....	6
A.    Solubility Properties of the Test Compound.....	6
B.    Toxicity and Dosage Determinations for the Test Compound.....	6
V. <u>SUMMARY OF TEST RESULTS</u> .....	7
VI. <u>INTERPRETATION OF RESULTS AND CONCLUSIONS</u> .....	14
A. <u>Salmonella typhimurium</u> .....	14
B. <u>Saccharomyces cerevisiae</u> .....	14
C.    Conclusions.....	14
APPENDIX-TABULATION OF DATA.....	A-1



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EVALUATION SUMMARY

Compound FDA 73-85, Potassium Alginate, did not exhibit genetic activity  
in any of the in vitro microbial assays employed in this evaluation.



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DATE: June 15, 1975

SPONSOR: Food and Drug Administration, Contract Number 223-74-2104

SUBJECT: Evaluation of Test Compound PM 9005361, Potassium Alginate FDA 73-85

I. OBJECTIVE

The objective of this study was to evaluate the test compound for genetic activity in microbial assays with and without the addition of mammalian metabolic activation preparations.

II. MATERIALS

A. Test Compound

1. Date Received: August, 1974
2. Description: Fine white powder

B. Indicator Microorganisms

The following strains of indicator microorganisms were used in the evaluation:

Yeast Strain: Saccharomyces cerevisiae, strain D4

Bacteria Strains: Salmonella typhimurium, strains: TA-1535  
TA-1537  
TA-1538

C. Reaction Mixture

The following reaction mixture was employed in the activation tests:

<u>Component</u>	<u>Final Concentration/ml</u>
1. TPN (sodium salt)	6 $\mu\text{M}$
2. Isocitric acid	49 $\mu\text{M}$
3. Tris buffer, pH 7.4	28 $\mu\text{M}$
4. $\text{MgCl}_2$	1.7 $\mu\text{M}$
5. Tissue homogenate fraction	72 mg



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#### D. Tissue Homogenates and Supernatants

The tissue homogenates and 9,000 x g supernatants were prepared from tissues of the following mammalian species: Mouse-ICR random bred adult males; rat-Sprague-Dawley adult males; and primate-Macaca mulatta adult males.

#### E. Positive Control Compounds

Table 1 lists chemicals for positive controls in the direct and activation assays.

TABLE 1  
POSITIVE CONTROLS USED IN DIRECT AND ACTIVATION ASSAYS

<u>Assay</u>	<u>Chemical<sup>a</sup></u>	<u>Solvent</u>	<u>Probable Mutagenic Specificity</u>
Nonactivation	Ethyl methanesulfonate	Water or saline	BPS <sup>b</sup> FS <sup>b</sup> FS <sup>b</sup>
	2-Nitrofluorene	Dimethylsulfoxide <sup>c</sup>	
	Quinacrine mustard	Water or saline	
Activation	Dimethylnitrosamine	Water or saline	BPS <sup>b</sup> FS <sup>b</sup>
	2-Acetylaminofluorene	Dimethylsulfoxide <sup>c</sup>	

<sup>a</sup> Concentrations given in the Results Section

<sup>b</sup> BPS = base-pair substitution; FS = frameshift

<sup>c</sup> Previously shown to be non-mutagenic

### III. METHODS

#### A. Toxicity

The solubility, toxicity and doses for all chemicals were determined prior to screening.

Each chemical was tested for survival against the specific indicator strains over a range of doses to determine the 50% survival dose.

Bacteria were tested in phosphate buffer, pH 7.4, for one hour at 37°C on a shaker. Yeasts were tested in phosphate buffer, pH 7.4, for four hours at 30°C on a shaker. The 50% survival curve and the 1/4 and 1/2 50% doses calculated.

If no toxicity was obtained for a chemical with a given strain, then a maximum dose of 5% (w/v) was used against the strain.

Unless otherwise specified, the doses calculated for the tests in buffer were applied to the activation tests. The solubility of the test chemical under treatment conditions is stated in the Results Section.



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## B. Plate Tests

In the nonactivation procedure, approximately  $10^9$  cells of a log phase culture of the bacterial indicator strains were spread over the surface of a minimal plate, and a measured amount of the test chemical was placed in the center of the test plate. In activation tests, the test chemical was added to the cells, and an aliquot of the mixture was spread on the surface of the test plate. The reaction mixture (0.1 ml) plus tissue extract was then spotted on the surface of the plate. Positive and solvent controls were included. All plates were incubated at 37°C for four days and then scored. Each compound (Test, Positive Control and Solvent Control) was done in duplicate. Concentrations of the positive control compounds are listed in the Results Section.

## C. Suspension Tests

### 1. Nonactivation

Log-phase bacteria and stationary-phase yeast cultures of the indicator organisms were grown in complete broth, washed and resuspended in 0.9% saline to densities of  $1 \times 10^9$  cells/ml and  $5 \times 10^7$  cells/ml, respectively. This constituted the working stock for tests of a group of test chemicals and their respective controls. Tests were conducted in plastic tissue culture plates. Cells plus appropriate volume(s) of the test chemical were added to the wells to give a final volume of 1.5 ml. The solvent replaced the test chemical in the negative controls. Treatment was at 30°C for four hours for yeast tests and at 37°C for one hour for bacterial tests. All flasks were shaken during treatment. Following treatment, the plates were set on ice. Aliquots of cells were removed, diluted in sterile saline (4°C) and plated on the appropriate complete media. Undiluted samples from flasks containing the bacteria were plated on minimal selective medium in reversion experiments. Samples from a  $10^{-1}$  dilution of treated cells were plated on the selected media for enumeration of gene conversion with strain D4. Bacterial plates were scored after incubation for 48 hours at 37°C. The yeast plates were incubated at 30°C for 3-5 days before scoring.

### 2. Activation

Bacteria and yeast cells were grown and prepared as described in the nonactivation tests. Measured amounts of the test and control chemicals plus 0.25 ml of the stock-cell suspension were added to wells of the Linbro plate containing the appropriate tissue fraction and reaction mixture. All flasks (bacteria and yeast) were incubated at 37°C in an oxygen atmosphere with shaking. The treatment times as well as the dilutions, plating procedures and scoring of the plates were the same as described for nonactivation tests.



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D. Preparation of Tissue Homogenates and 9,000 x g Cell Fractions

Male animals (sufficient to provide the necessary quantities of tissues) were killed by cranial blow, decapitated and bled. Organs were immediately dissected from the animal using aseptic techniques and placed in ice-cold 0.25 M sucrose buffered with Tris at pH of 7.4. Upon collection of the desired quantity of organs, they were washed twice with fresh buffered sucrose and completely homogenized with a motor-driven homogenizing unit at 4°C. The whole organ homogenate obtained from this step was divided into two samples. One sample was frozen at -80°C and the other was centrifuged for 20 minutes at 9,000 x g in a refrigerated centrifuge. The supernatant from the centrifuged sample was retained and frozen at -80°C. These two frozen samples were used for the activation studies.

E. Data Recording and Reporting

Following the specified incubation periods all population plates were scored by an automatic colony counter and the results from each plate of a set were recorded, in ink, on data processing forms. All minimal or other types of selective media plates were hand scored and the results recorded along with the respective population data. Other relevant experimental data were recorded on experimental definition forms. For bacteria strains the number of colonies recorded from either the population or selective plates represents that number in 1 ml of test suspension plated. The numbers recorded for the yeast strain D4 represent the number in 0.5 ml of test suspension plated. The data were then processed and printed from a computer program.



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IV. RESULTS SECTION

A. Solubility Properties of the Test Compound

1. Name or code designation of the test compound: PM9005361  
Potassium Alginate
2. Test solvent: DMSO
3. Solubility of the test compound under treatment conditions:  
Insoluble under treatment conditions
4. Additional comments: Fine white powder

B. Toxicity and Dosage Determinations for the Test Compound

1. Test date for toxicity determination: March 25, 1975
2. The 50% survival level was determined for bacteria and yeast indicator organisms by conducting survival curves with the test compound at the following concentrations:

Percent Concentration (w/v or v/v)

3.0  
0.3  
0.03  
0.003  
0.0003

3. Concentrations of the test compound used in the mutagenicity tests:

<u>Dose</u>	<u>Percent Concentration</u>	
	<u>Bacteria</u>	<u>Yeast</u>
1/4 50% Survival	2.5	2.5
1/2 50% Survival	5.0	5.0
50% Survival	10.0	10.0
Plate Tests	5.0	--



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V. SUMMARY OF TEST RESULTS

Plate Tests

- A. Name or code designation of the test compound: PM905361 Potassium Alginate  
 B. Test date: April 25, 1975  
 C. Concentration of the test compound: 5.0%

Test	Species	Tissue	REVERTANTS/PLATE					
			TA-1535		TA-1537		TA-1538	
1	2	1	2	1	2	1	2	
<b>1. Non-activation</b>								
Solvent Control	---	---	11	2	22	33	15	7
Positive Control <sup>a</sup>	---	---	>10 <sup>3</sup>	>10 <sup>3</sup>	138	133	138	122
Test Compound	---	---	10	7	19	28	5	7
<b>2. Activation</b>								
Negative Control	---	---	8	12	7	7	6	18
Solvent Control	---	---	13	4	15	16	23	21
Reaction Mixture Control	---	---	7	10	8	8	10	18
Positive Control <sup>b</sup>	Mouse	Liver	>10 <sup>3</sup>	>10 <sup>3</sup>	41	43	307	420
Positive Control		Lung	11	13	5	12	72	30
Positive Control		Testes	9	11	22	10	19	22
Positive Control	Rat	Liver	>10 <sup>3</sup>	>10 <sup>3</sup>	41	45	327	340
Positive Control		Lung	12	9	7	7	26	29
Positive Control		Testes	9	11	22	10	19	22
Positive Control	Monkey	Liver	390	329	44	41	363	310
Positive Control		Lung	11	9	7	10	21	24
Positive Control		Testes	9	12	16	6	17	12
Test Compound	Mouse	Liver	13	5	16	12	19	20
Test Compound		Lung	16	9	5	6	14	16
Test Compound		Testes	11	23	6	6	17	14
Test Compound	Rat	Liver	13	5	14	10	16	9
Test Compound		Lung	12	10	7	6	12	9
Test Compound		Testes	13	19	6	4	11	5
Test Compound	Monkey	Liver	15	4	15	13	13	10
Test Compound		Lung	10	10	6	8	14	13
Test Compound		Testes	15	26	7	4	9	2

a TA-1535 EMS 10 µl/plate  
 TA-1537 QM 20 µg/plate  
 TA-1538 NF 100 µg/plate

b TA-1535 DMNA 50 µM/plate  
 TA-1537 AAF 100 µg/plate  
 TA-1538 AAF 100 µg/plate



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**DATA TABLE TERMS AND ABBREVIATIONS**

<u>ABBREVIATION OR TERM</u>	<u>DEFINITION OR EXPLANATION</u>																												
COMPOUND	Client designated compound number appears in this column.																												
TEST CODES	<table> <tr> <td>NAN</td><td>= Nonactivation: Solvent Control</td></tr> <tr> <td>NAP</td><td>= Nonactivation: Positive Control</td></tr> <tr> <td>NA1</td><td>= Nonactivation: Test Compound Dose 1</td></tr> <tr> <td>NA2, etc.</td><td>= Reflects the other dose level(s)</td></tr> <tr> <td>A+C</td><td>= Negative Chemical Control</td></tr> <tr> <td>A-C</td><td>= Activation: Solvent Control</td></tr> <tr> <td>ACP</td><td>= Activation: Positive Control</td></tr> <tr> <td>ACT</td><td>= Activation: Test Compound</td></tr> <tr> <td>A+T</td><td>= Activation: Tissue Control</td></tr> <tr> <td>LI</td><td>= Liver Tissue Activation Fraction</td></tr> <tr> <td>LU</td><td>= Lung Tissue Activation Fraction</td></tr> <tr> <td>KI</td><td>= Kidney Tissue Activation Fraction</td></tr> <tr> <td>TE</td><td>= Testes Tissue Activation Fraction</td></tr> <tr> <td>1,2, etc.</td><td>= Dose Levels</td></tr> </table>	NAN	= Nonactivation: Solvent Control	NAP	= Nonactivation: Positive Control	NA1	= Nonactivation: Test Compound Dose 1	NA2, etc.	= Reflects the other dose level(s)	A+C	= Negative Chemical Control	A-C	= Activation: Solvent Control	ACP	= Activation: Positive Control	ACT	= Activation: Test Compound	A+T	= Activation: Tissue Control	LI	= Liver Tissue Activation Fraction	LU	= Lung Tissue Activation Fraction	KI	= Kidney Tissue Activation Fraction	TE	= Testes Tissue Activation Fraction	1,2, etc.	= Dose Levels
NAN	= Nonactivation: Solvent Control																												
NAP	= Nonactivation: Positive Control																												
NA1	= Nonactivation: Test Compound Dose 1																												
NA2, etc.	= Reflects the other dose level(s)																												
A+C	= Negative Chemical Control																												
A-C	= Activation: Solvent Control																												
ACP	= Activation: Positive Control																												
ACT	= Activation: Test Compound																												
A+T	= Activation: Tissue Control																												
LI	= Liver Tissue Activation Fraction																												
LU	= Lung Tissue Activation Fraction																												
KI	= Kidney Tissue Activation Fraction																												
TE	= Testes Tissue Activation Fraction																												
1,2, etc.	= Dose Levels																												
CONCENTRATION	All test compound dose levels are expressed as a whole number followed by an exponent (negative) identified by the appropriate units.  Example: 0025-2PCT = 0.25 percent concentration																												
POPU	Total number of viable cells in the plating sample raised to some exponent printed directly below the abbreviation (i.e., EP + 6 = $\times 10^6$ ).																												
MUT 1	Total number of mutants or convertants obtained from the sample plated raised to some exponent printed directly below the abbreviation (i.e., EP + 0 = $10^0$ ). For strain D4, MUT 1 represents the number of ADE+ convertants.																												
MUT 2	Only used for strain D4 and represents the number of TRY+ convertants in the plated sample.																												
FREQ 1	The calculated mutation or gene conversion frequency times the negative exponent written directly below. For strain D4, FREQ 1 represents the ADE+ value.																												
FREQ 2	Only used for strain D4 and represents the TRY+ conversion frequency.																												
CONTAM	Presence of contamination on any plates.																												



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**DATA TABLE TERMS AND ABBREVIATIONS (continued)**

<u>ABBREVIATION OR TERM</u>	<u>DEFINITION OR EXPLANATION</u>
AAF	2-Acetylaminofluorene
DMSO	Dimethylsulfoxide
DMN	Dimethylnitrosamine
EMS	Ethyl Methanesulfonate
QM	Quinacrine Mustard
NF	Nitrofluorene
SPECIES	Animal Strains
SPRDAW	Sprague Dawley Rats
ICRFLO	Flow ICR Random Bred Mice
RHESUS	Rhesus Monkey ( <u>Macaca mulatta</u> )
MIXEDB	Dog, Mixed Breed
NEWZEA	New Zealand White Rabbit



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LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM  
REPORT EXR34

COMPOUND FREQUENCY SUMMARY REPORT 07/08/75

	SPECIES	/		COMPOUND P#9005361		
TEST	ORG	TA1535 HIS EX-8	TA1538 HIS EX-8	TA1537 HIS EX-8	0000D4 AID EX-5	0000D4 TRY EX-5
NAN		12.94	1.24	5.32	1.89	1.48
NAP		771.32	922.93	1764.20	129.05	155.87
NA1		5.22	1.33	4.24	0.32	0.32
NA2		4.50	1.24	9.83	0.73	0.59



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LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM  
REPORT EXR34

COMPOUND FREQUENCY SUMMARY REPORT 07/08/75

SPECIES TORPEDO/MOUSE COMPOUND PM9005361

TEST	ORG	TA1537 HIS EX-8	TA1535 HTS EX-8	TA1535 HIS EX-8	TA1538 HIS EX-8	000004 ADP EX-5	000004 TRY EX-5
ACT	A+C	20.45		3.23	6.88	2.25	1.59
ACT	A+T	35.90		7.69	6.31	3.25	1.59
ACT	A-C	12.22	7.45	3.73	2.93	0.96	0.17
ACT	PLT	45.07		5496.88	15.26	7.59	4.16
ACT	PLU	20.50		4.79	4.48	2.42	2.60
ACT	PTE	28.79		9.15	2.33	3.81	2.06
ACT	LT1	8.72		0.62	4.22	0.32	0.97
ACT	LT2	8.88		1.88	3.06	0.72	2.42
ACT	LU1	1.69	1.95	0.10	2.25	3.15	3.15
ACT	LU2	8.31	4.39	0.00	2.14	1.23	1.58
ACT	TF1	6.12		2.83	2.82	2.13	2.26
ACT	TF2	7.26		1.96	2.04	0.42	1.68



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LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM  
REPORT EXR34

COMPOUND FREQUENCY SUMMARY REPORT 07/08/75

SPECIES SPRDAM/RAT COMPOUND PM9005361

TEST	ORG	TA1537	TA1535	TA1538	000004	000004
		HIS EX-8	HIS EX-8	HIS EX-8	ADP EX-5	TRY EX-5
ACT	A+C	10.86	4.48	4.75	2.85	1.11
ACT	A+T	10.31	2.48	6.57	2.43	1.66
ACT	A-C	8.87	5.52	9.05	2.68	1.44
ACT	PLI	17.19	333.15	20.33	4.50	4.42
ACT	PLU	14.09	6.11	8.76	2.49	1.03
ACT	PTE	11.40	8.60	6.77	3.24	1.66
ACT	LI1	5.09	2.22	1.34	1.90	1.64
ACT	LI2	5.15	1.19	3.45	1.69	0.97
ACT	LU1	10.61	6.76	2.75	2.65	1.43
ACT	LU2	10.33	10.78	3.30	1.30	1.07
ACT	TE1	7.40	12.47	4.71	1.76	1.53
ACT	TE2	11.84	9.00	3.31	2.67	1.65



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LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM  
REPORT EXR34

COMPOUND FREQUENCY SUMMARY REPORT 07/08/75

SPECIES Rhesus/Monkey

COMPOUND P49005361

TEST	ORG	TA1537	TA1535	TA1538	000004	000004
		HIS EX-8	HIS EX-8	HIS EX-8	ADE EX-5	TRY EX-5
ACT	A+C	6.36	4.50	10.43	1.82	1.82
ACT	A+T	3.92	5.62	5.80	2.59	2.73
ACT	A-C	5.63	7.72	2.70	2.16	1.80
ACT	PL-I	10.56	1194.98	54.55	6.38	3.75
ACT	PLU	5.60	5.81	5.22	2.40	2.64
ACT	PTE	8.26	3.99	6.61	5.41	2.30
ACT	L11	6.86	1.11	1.64	1.45	1.70
ACT	L12	7.16	2.30	2.72	1.35	0.95
ACT	LU1	3.65	2.13	0.68	0.51	0.51
ACT	LU2	3.60	2.67	2.17	1.35	0.73
ACT	TF1	3.51	2.65	3.03	1.41	0.98
ACT	TF2	4.64	2.73	6.29	1.82	9.37



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## VI. INTERPRETATION OF RESULTS AND CONCLUSIONS

Compound PM9005361, Potassium Alginate, was tested for genetic activity in a series of in vitro microbial assays with and without metabolic activation. The following results were obtained:

### A. Salmonella typhimurium

#### 1. Plate tests

At a concentration of 5.0%, PM905361, was not mutagenic for any of the bacterial indicator strains with or without activation.

#### 2. Nonactivation suspension tests

The results of these tests were negative.

#### 3. Activation suspension tests

The results of these tests were negative. The LU1 and LU2 dose with TA-1535 using mouse tissue were repeated. Unusually low revertant counts were obtained in this initial run. The retests were negative.

### B. Saccharomyces cerevisiae

#### 1. Nonactivation suspension tests

The results of these tests were negative.

#### 2. Activation suspension tests

The results of these tests were negative.

### C. Conclusions

The test compound Potassium Alginate, did not exhibit genetic activity in any of the assays employed in this evaluation.

Submitted by:



David Brusick, Ph.D.  
Director of Genetics



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**APPENDIX**

**Tabulation of Data**



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REPORT EXR33 LITTON BIONETICS MITOGENIC ACTIVITY SYSTEM  
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104

EXPERIMENT 509802 DETECTOR TA1535 SPECIES /

PROJECT 02468

DATE - 07/08/75

ORG	TEST ID	CONCENTRATION	POP!!	MUT1	FRF01	DATE
NAN	SALINE	0487	0063	12.94	FP-R	07/08/75
NAP	FMS 0.002 %	0537	4142	771.32		
PM9005361	NA1	0005-0 PCT.	0383	0020	5.22	
PM9005361	NA2	0025-1 PCT.	0489	0022	4.50	



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REPORT EXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM  
COMPOUND SUMMARY RACKUP DETAIL

CONTRACT 22374-2104

EXPERIMENT 511301 DETECTOR TA1537

ORG	TEST IN	CONCENTRATION	SPECIES	PROJECT NO 468	DATE - 07/08/75
CMPD(1)	FP+R	FP+R	/	FRF01	CONTAM
NAN	SALINE	0.601	0032	5.32	0
NAP	OM 1.0 UG/ML	0.257	4534	1764.20	0
PM9005361	NA1	0005-0 PCT.	0377	0016	4.24
PM9005361	NA2	0025-1 PCT.	0722	0071	9.83



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REPORT FXR33 LITTON BIONETICS MASTAGENIC ACTIVITY SYSTEM  
COMPUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104  
EXPERIMENT 509803 DETECTOR TA1538 SPFCIES /  
PR0JEC T 07468

COMPUND	ORG	TEST IN	CONCENTRATION	PNP1 EP+6	MUT1 EP+0	FRF01 FP-R	FRF01 FP-N	CONTAM
NAN	DMSO			0563	0007	1.24	0	
NAP	NF 125 0G-ML			0567	5233	922.93	0	
PM9005361	NA1	0005-0 PCT.		0675	0009	1.33	0	
PM9005361	NA2	0025-1 PCT.		0806	0010	1.24	0	

DATE - 07/09/75

REPORT FXR33 LITTON BIONETICS MILITAGENIC ACTIVITY SYSTEM  
 COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104  
 EXPERIMENT 514705 DETECTOR 000004

COMPOUND	TEST	ORG	ID	CONCENTRATION	P0P01 EP+4	M0T1 EP+1	M0T2 EP+1	FRF01 FP-5	FRF02 FP-5	DAFE - 07/08/75
PROJECT 02468										
NAN		SALINF			0741	0014	0011	1.89	1.48	0
NAP		FMS 1.0 %			0179	0231	0279	129.05	155.87	0
PW9005361	NA1	0005-0 PCT.			0630	0002	0002	0.37	0.37	0
PW9005361	NA2	0025-1 PCT.			0682	0005	0004	0.73	0.59	0



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REPORT FXR33 LITTON RIONETICS MILAGENIC ACTIVITY SYSTEM  
COMPOUND SUMMARY BACKUP DETAIL

EXPERIMENT	PROJECT	CONTRACT	TEST	ORG	IN	CONCENTRATION	SPECIES	ICRFLN/MOUSE	DATE
509401	02468	22374-2104	DETECTOR	TA1535			PNUPI	MUT1	07/08/75
				A+C		DMN 50 UM/ML	EP+6	FP+8	
				A+T		***NON MATCH***	0156	0012	
				A-C		SALINE	0670	0025	
				ACP	L1	DMN 50 UM/ML	0096	5277	
				ACP	LU	DMN 50 UM/ML	0313	0015	
				ACP	TE	DMN 50 UM/ML	0153	0014	
				PM9005361	ACT	L11	0005-0 PCT.	0967	0006
				PM9005361	ACT	L12	0025-1 PCT.	1332	0025
				PM9005361	ACT	L01	0005-0 PCT.	0973	0001
				PM9005361	ACT	L02	0025-1 PCT.	1488	0000
				PM9005361	ACT	TE1	0005-0 PCT.	0636	0018
				PM9005361	ACT	TE2	0025-1 PCT.	1428	0028



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REPORT EXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM  
COMPOUND SUMMARY BACKUP DETAIL

EXPERIMENT	CONTRACT	DETECTOR	TA1535	SPECIES	ICRFLD/MOUSE	PROJECT	02468	DATE	- 07/08/75
COMPOUND	ORG	ID	CONCENTRATION	POPUL	MUT	FREQ1	FP-8	CONTAM	
A-C	ACT	LU1	0005-0 PCT.	EP+6	EP+0				
PM9005361	A-C	SALINE		0738	0055	7.45		0	
PM9005361	ACT	LU2	0025-1 PCT.	1640	0032	1.95		0	
				1230	0054	4.39			2



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REPORT EXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM  
COMPOUND SUMMARY BACKUP DETAIL

EXPERIMENT	CONTRACT	NUMBER	SPECIES	PROJECT	DATE
517602	22374-2104	TA1537	ICRFL0/M01JSF	02468	07/08/75
				FRFO1	CONT'D.
				FP-R	
A+C	AAF 800 UG/ML	0308	0063	20.45	0
A+T	***NO MATCH***	0072	0028	35.90	1
A-C	DMSO	0483	0059	12.22	0
ACP	L1 AAF 800 UG/ML	0071	0032	45.07	1
ACP	LJ AAF 800 UG/ML	0161	0033	20.50	0
ACP	TE AAF 800 UG/ML	0198	0057	28.79	0
PM9005361	ACT L11 0005-0 PCT.	0195	0017	8.72	0
PM9005361	ACT LJ2 0025-1 PCT.	0349	0031	8.88	0
PM9005361	ACT LJ1 0005-0 PCT.	0178	0003	1.69	1
PM9005361	ACT LJ2 0025-1 PCT.	0409	0034	8.31	0
PM9005361	ACT TF1 0005-0 PCT.	0098	0006	6.12	0
PM9005361	ACT TF2 0025-1 PCT.	0606	0044	7.26	0



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REPORT FXR33 LITTON RIONETICS MUTAGENIC ACTIVITY SYSTEM  
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104  
EXPERIMENT 509701 DETECTOR TA1538 SPECIES ICRLN/MUSF

COMPOUND	TFST	ORG	IN	CONCENTRATION	P0P01	MUT1	FRF01	CONTAM
A+C		AAF	800	UG/ML	0858	0059	6.88	0
A+T		***NO MATCH***		0656	0042	6.31	0	0
A-C		DMSO			0819	0024	2.93	0
ACP	L1	AAF	800	UG/ML	0675	0103	15.26	0
ACP	LU	AAF	800	UG/ML	1026	0046	4.48	?
ACP	TE	AAF	800	UG/ML	0945	0022	2.33	0
PM9005361	ACT	L11	0005-0	PCT.	0450	0019	4.22	0
PM9005361	ACT	L12	0025-1	PCT.	0752	0023	3.06	0
PM9005361	ACT	L01	0005-0	PCT.	0533	0012	2.25	?
PM9005361	ACT	L02	0025-1	PCT.	0702	0015	2.14	?
PM9005361	ACT	TE1	0005-0	PCT.	0744	0021	2.82	0
PM9005361	ACT	TF2	0025-1	PCT.	0637	0013	2.04	0

REPORT FXR33 LITTON BIONETICS MITOGENIC ACTIVITY SYSTEM  
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104

EXPERIMENT 512601 DETECTOR 000004

ORG PROJECT 07468

COMPUND TEST SPECIES ICRCFLD/MONISE

ID CONCENTRATION

PMN 90 UM/ML

A+C 0755 EP+4

FRFG1

MUT1 FP+1

FRFG2 FP-5

MUT2 FP+1

FRFG3 FP-5

CNTA

DMN 90 UM/ML

A+T 0017 EP+4

FRFG4

MUT3 FP+1

FRFG5 FP-5

MUT4 FP+1

FRFG6 FP-5

CNTA

\*NMN MATCH\*\*\*

A-C 1260 EP+4

FRFG7

MUT5 FP+1

FRFG8 FP-5

MUT6 FP+1

FRFG9 FP-5

CNTA

SALINE

A+C 0011 EP+4

FRFG10

MUT7 FP+1

FRFG11 FP-5

MUT8 FP+1

FRFG12 FP-5

CNTA



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REPORT EXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM  
COMPOUND SUMMARY BACKUP DETAIL

EXPERIMENT 510801		CONTRACT 22374-2104		PROJECT 02468		DATE - 07/08/75	
		DETECTOR TAI535	SPECIES SPRDAW/RAT				
A+C		DMMN 50 UM/ML	0692	0031	4.048	0	0
A+T		***IND MATCH***	0483	0012	2.048	3	3
A-C		SALINE	0725	0040	5.052	0	0
ACP	L1	DMMN 50 UM/ML	0368	1226	333.015	1	1
ACP	L11	DMMN 50 UM/ML	0311	0019	6.011	0	0
ACP	TE	DMMN 50 UM/ML	0349	0030	8.060	0	0
PM9005361	ACT	L11	0005-0 PCT.	0451	0010	2.022	2
PM9005361	ACT	L12	0025-1 PCT.	0505	0006	1.019	2
PM9005361	ACT	L01	0005-0 PCT.	0340	0023	6.076	0
PM9005361	ACT	L02	0025-1 PCT.	0436	0047	10.078	0
PM9005361	ACT	TF1	0005-0 PCT.	0393	0049	12.047	0
PM9005361	ACT	TF2	0025-1 PCT.	0389	0035	0.000	0

REPORT EXR33 LITTON BIONETICS MITAGENIC ACTIVITY SYSTEM  
COMPUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104  
EXPERIMENT 511501 DETECTOR TA1537 PROJECT 02468  
SPRDAY/RAT

COMPOUND	TEST	ORG ID	CONCENTRATION	PPM	MINI	FREQ1	FREQ2	CONTAM
A+C		AAF 800 ug/ml	0663	0072	10.86	0	0	
A+T		***NO MATCH***	0446	0046	10.31	0	0	
A-C		DMSO	0683	0061	8.87	0	0	
ACP	L1	AAF 800 ug/ml	0512	0088	17.19	2	2	
ACP	LU	AAF 800 ug/ml	0589	0083	14.09	0	0	
ACP	TE	AAF 800 ug/ml	0544	0062	11.40	0	0	
PM9005361	ACT	L11	0005-0 PCT.	0491	0025	5.09	2	
PM9005361	ACT	L12	0025-1 PCT.	0758	0039	5.15	0	
PM9005361	ACT	L01	0005-0 PCT.	0443	0047	10.61	0	
PM9005361	ACT	L12	0025-1 PCT.	0455	0047	10.33	2	
PM9005361	ACT	TF1	0005-0 PCT.	0419	0031	7.40	0	
PM9005361	ACT	TF2	0025-1 PCT.	0380	0045	11.84	0	



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REPORT FXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM  
COMPOUND SUMMARY RACKUP DETAIL

CONTRACT 22374-2104  
EXPERIMENT 511801 DETECTOR TA1538 PROJECT 02468  
DATE - 07/08/75

COMPUND	TEST	ORG	IN	CONCENTRATION	P0P01	MUT1	FRE01	CONTAM
A+C	AAF	800	UG/ML	0926	0044	4.76	0	
A+T	***NO MATCH***			0757	0052	6.57	0	
A-C	DMSO			0707	0064	9.05	0	
ACP	L.I	AAF	800	UG/ML	0718	0146	20.33	?
ACP	L.I	AAF	800	UG/ML	0833	0073	8.76	0
ACP	TE	AAF	800	UG/ML	0886	0060	6.77	2
PM9005361	ACT	LII	0005-0 PCT.	0598	0008	1.34	0	
PM9005361	ACT	LII2	0025-1 PCT.	0579	0020	3.45	0	
PM9005361	ACT	LII1	0005-0 PCT.	0763	0021	2.75	0	
PM9005361	ACT	LII2	0025-1 PCT.	0667	0022	3.30	0	
PM9005361	ACT	TF1	0005-0 PCT.	0806	0038	6.71	0	
PM9005361	ACT	TF2	0025-1 PCT.	0967	0032	3.31	0	



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REPORT FXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM  
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104  
EXPERIMENT 512501 DETECTOR 000004

PROJECT 02468  
SPECIES SPRDAW/RAT  
DATE - 07/08/75

COMPOUND	TEST ID	CONCENTRATION	PNP11	MUT1	MUT2	FREQ1	FREQ2	CONTAM
A+C	DNN 90 UM/ML	1438	0041	0016	2.85	1.11	0	
A+T	***NON MATCH***	0906	0022	0015	2.43	1.66	7	
A-C	SALINE	1044	0028	0015	2.68	1.44	0	
ACP	L1	DNN 90 UM/ML	1177	0053	0052	4.50	4.42	6
ACP	L2	DNN 90 UM/ML	1167	0029	0012	2.49	1.03	0
ACP	TE	DNN 90 UM/ML	1203	0039	0020	3.24	1.66	0
PM9005361	ACT	L11 0005-0 PCT.	0791	0015	0013	1.90	1.64	5
PM9005361	ACT	L12 0025-1 PCT.	0829	0014	0008	1.69	0.97	0
PM9005361	ACT	L01 0005-0 PCT.	0982	0026	0014	2.65	1.43	4
PM9005361	ACT	L02 0025-1 PCT.	0843	0011	0009	1.30	1.07	0
PM9005361	ACT	TE1 0005-0 PCT.	0851	0015	0013	1.76	1.53	4
PM9005361	ACT	TF2 0025-1 PCT.	0972	0026	0016	2.67	1.65	4

REPORT EXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM  
COMPOUND SUMMARY BACKUP DETAIL

EXPERIMENT 509901 CONTRACT 22374-2104				SPECIES RHFSSUS/MONKEY PROJECT 02468				DATE - 07/08/75	
COMPOUND	TEST	IN	CONCENTRATION	P0P01	M0T1	F0F01	F0P-R	CONTAM	
A+C		DNN 50 UM/ML	0756	0034		4.50		0	
A+T		***NO MATCH***	0534	0030		5.67		0	
A-C		SALINE	0479	0037		7.77		1	
ACP	L1	DNN 50 UM/ML	0453	5473		1194.98		0	
ACP	L1	DNN 50 UM/ML	0551	0032		5.81		0	
ACP	TE	DNN 50 UM/ML	0426	0017		3.99		2	
PM9005361	ACT	L11 0005-0 PCT.	1536	0017		1.11		0	
PM9005361	ACT	L12 0025-1 PCT.	1174	0027		2.30		2	
PM9005361	ACT	L01 0005-0 PCT.	1218	0026		2.13		0	
PM9005361	ACT	L02 0025-1 PCT.	1125	0030		2.67		0	
PM9005361	ACT	TE1 0005-0 PCT.	1020	0027		2.65		0	
PM9005361	ACT	TF2 0025-1 PCT.	0990	0027		2.73		0	



**BIONETICS**

REPORT FXR33 LITTON BIOMETICS MUTAGENIC ACTIVITY SYSTEM  
COMPOUND SUMMARY BACKUP DETAIL

EXPERIMENT 511901 CONTRACT 22374-2104 DETECTOR TA1537 PROJECT 02468  
DATE - 07/08/75

COMPOUND	TEST ID	CONCENTRATION	PPM	MUFTI	ERFOL	CONTAM
A+C	AAF 800 ug/ml	0692	0044	6.36	0	0
A+T	***NIN MATCH***	0638	0025	3.92	0	0
A-C	DMSO	0533	0030	5.63	0	0
ACP	LI AAF 800 ug/ml	0606	0064	10.56	0	0
ACP	LU AAF 800 ug/ml	0643	0036	5.60	0	0
ACP	TE AAF 800 ug/ml	0545	0045	8.26	0	0
PM9005361	ACT LI1 0005-0 PCT.	0408	0028	6.86	0	0
PM9005361	ACT LI2 0025-1 PCT.	0489	0035	7.16	0	0
PM9005361	ACT LI1 0005-0 PCT.	0685	0025	3.65	0	0
PM9005361	ACT LI2 0025-1 PCT.	0639	0023	3.60	2	0
PM9005361	ACT TE1 0005-0 PCT.	1025	0036	3.51	0	0
PM9005361	ACT TF2 0025-1 PCT.	0689	0032	4.64	0	0



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REPORT FXR33 LITTON BIOMETICS MUTAGENIC ACTIVITY SYSTEM  
COMPOUND SUMMARY BACKUP DETAIL

CONTRACT 22374-2104  
EXPERIMENT 510001 DECTECTOR TA1538 SPECIES RHESUS/MONKEY  
PROJECT 07469

COMPOUND	ORG	TEST ID	CONCENTRATION	PPM	MULTI	PPM	PPM	CONTAM
A+C	AAF	800 UG/ML	0748	0078	10.43	0	0	0
A+T	***NN MATCH***	(1742	0043	5.80	2	2	2	2
A-C	DMSO	0742	0020	2.70	2	2	2	2
ACP	L1	AAF 800 UG/ML	6638	0348	54.55	0	0	0
ACP	L10	AAF 800 UG/ML	0901	0047	5.22	0	0	0
ACP	TE	AAF 800 UG/ML	0681	0045	6.61	0	0	0
PM9005361	ACT	L11	0005-0 PCT.	0672	0011	1.64	2	2
PM9005361	ACT	L12	0025-1 PCT.	1289	0035	2.72	2	2
PM9005361	ACT	L11	0005-0 PCT.	0876	0006	0.68	0	0
PM9005361	ACT	L12	0025-1 PCT.	1336	0029	2.17	0	0
PM9005361	ACT	TF1	0005-0 PCT.	1088	0033	3.03	0	0
PM9005361	ACT	TF2	0025-1 PCT.	0715	0045	6.29	0	0

REPORT EXR33 LITTON BIONETICS MUTAGENIC ACTIVITY SYSTEM  
COMPOUND SUMMARY BACKUP DETAIL

EXPERIMENT	CONTRACT	DETECTOR	NUMBER	SPECIES	RHEUS/MINKFY	PROJECT	DATE		
514202	22374-2104		000004			02468	07/08/75		
ORG	TEST ID	CONCENTRATION	PPM	MUTL	MUT?	FREQ1	FREQ2		
A+C	DNN 90 UM/ML	0658	0012	0012	1.87	FP-5	CONTAM		
A+T	***NON MATCH***	0695	0018	0019	2.59	2.73	1		
A-C	SALINE	0555	0012	0010	2.16	1.80	7		
ACP	L1	DNN 90 UM/ML	0799	0051	0030	6.38	3.75	0	
ACP	L2	DNN 90 UM/ML	0832	0020	0022	2.40	2.64	1	
ACP	TE	DNN 90 UM/ML	0739	0040	0017	5.41	2.30	4	
PM9005361	ACT	L11	0005-0 PCT.	0825	0012	0014	1.45	1.70	0
PM9005361	ACT	L12	0025-1 PCT.	0740	0010	0007	1.35	0.95	4
PM9005361	ACT	L11	0005-0 PCT.	0586	0003	0003	0.51	0.51	4
PM9005361	ACT	L12	0025-1 PCT.	0817	0011	0006	1.35	0.73	4
PM9005361	ACT	TF1	0005-0 PCT.	0711	0010	0007	1.41	0.98	5
PM9005361	ACT	TF2	0025-1 PCT.	0715	0013	0067	1.87	9.37	0



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